THE JOURNAL OF PHYSIOLOGY

EDITED FOR

THE PHYSIOLOGICAL SOCIETY

BY

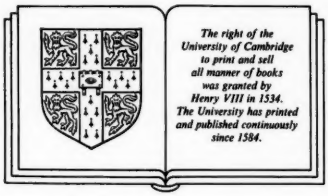
D. G. ALLEN W. ALMERS D. BARTLETT
T. B. BOLTON W. F. BORON M. W. B. BRADBURY
D. A. BROWN NANCY A. CURTIN N. W. DAW
M. DE BURGH DALY G. J. DOCKRAY R. FETTIPLACE
BARBARA P. FULTON W. R. GILES Y. E. GOLDMAN
G. GORDON BERNARD KATZ J. S. KELLY
P. A. KIRKWOOD H. W. KOSTERLITZ R. N. LEMON
C. J. LOTE M. I. M. NOBLE DALE PURVES
R. R. RIBCHESTER D. W. RICHTER T. J. RINK
B. SAKMANN T. J. B. SIMONS N. B. STANDEN
S. WEIDMANN G. WESTHEIMER

C. A. R. BOYD, R. E. J. DYBALL & P. R. STANFIELD
(*Distributing Editors*)
T. D. LAMB (*Secretary*) A. V. EDWARDS (*Chairman*)

Volume 394
1987

CAMBRIDGE UNIVERSITY PRESS
Cambridge
New York New Rochelle Melbourne Sydney

Published by the Press Syndicate of the University of Cambridge
The Pitt Building, Trumpington Street, Cambridge CB2 1RP
32 East 57th Street, New York, NY 10022, USA
10 Stamford Road, Oakleigh, Melbourne 3166, Australia



© The Physiological Society 1987

JPHYA 7 394 1–594 (1987)
ISSN 0022 3751

Printed in Great Britain by the
University Press, Cambridge

CONTENTS OF VOLUME 394

December 1987 (2)

FOWDEN A.L., HARDING R., RALPH M.M. & THORBURN G.D. The nutritional regulation of plasma prostaglandin E concentrations in the fetus and pregnant ewe during late gestation. 1

GARLAND H.O., LEWIS A.G. & MILNE C.M. Altered renal function in chronically hyperprolactinaemic rats. 13

LIGHTMAN Stafford L. & YOUNG III W. Scott Vasopressin, oxytocin, dynorphin, enkephalin and corticotrophin-releasing factor mRNA stimulation in the rat. 23

CHEN Bing, MACLEOD Donald I.A. & STOCKMAN Andrew Improvement in human vision under bright light: grain or gain? 41

LOVE J.A. & SZURSZEWSKI J.H. The electrophysiological effects of vasoactive intestinal polypeptide in the guinea-pig inferior mesenteric ganglion. 67

AKAIKE N., MARUYAMA T. & TOKUTOMI N. Kinetic properties of the pentobarbitone-gated chloride current in frog sensory neurones. 85

ANDRADE Rodrigo & NICOLL Roger A. Pharmacologically distinct actions of serotonin on single pyramidal neurones of the rat hippocampus recorded *in vitro*. 99

BADER C.R., BERTRAND D. & SCHLICHTER R. Calcium-activated chloride current in cultured sensory and parasympathetic quail neurones. 125

FOX Aaron P., NOWYCKY Martha C. & TSIEN Richard W. Kinetic and pharmacological properties distinguishing three types of calcium currents in chick sensory neurones. 149

FOX Aaron P., NOWYCKY Martha C. & TSIEN Richard W. Single-channel recordings of three types of calcium channels in chick sensory neurones. 173

ONO Taketoshi, SASAKI Kazuo & SHIBATA Ryoko Diurnal- and behaviour-related activity of ventromedial hypothalamic neurones in freely behaving rats. 201

ONO Taketoshi, SASAKI Kazuo & SHIBATA Ryoko Feeding- and chemical-related activity of ventromedial hypothalamic neurones in freely behaving rats. 221

LLANO I. & MARTY A. Protein kinase C activators inhibit the inositol trisphosphate-mediated muscarinic current responses in rat lacrimal cells. 239

KAPPAGODA C.T., MAN G.C.W. & TEO K.K. Behaviour of canine pulmonary vagal afferent receptors during sustained acute pulmonary venous pressure elevation. 249

CHERON G. & GODAUX E. Disabling of the oculomotor neural integrator by kainic acid injections in the prepositus–vestibular complex of the cat. 267

COLERIDGE H.M., COLERIDGE J.C.G. & SCHULTZ H.D. Characteristics of C fibre baroreceptors in the carotid sinus of dogs. 291

GOH J.W. & PENNEFATHER P.S. Pharmacological and physiological properties of the after-hyperpolarization current of bullfrog ganglion neurones. 315

CASSELL J.F. & MCLACHLAN Elspeth M. Two calcium-activated potassium conductances in a subpopulation of coeliac neurones of guinea-pig and rabbit. 331

MARPLE-HORVAT D.E. & STEIN J.F. Cerebellar neuronal activity related to arm movements in trained rhesus monkeys. 351

ABRAHAM W.C., GUSTAFSSON B. & WIGSTRÖM H. Long-term potentiation involves enhanced synaptic excitation relative to synaptic inhibition in guinea-pig hippocampus. 367

BULL Judith S., GRUNDY D. & SCRATCHERD T. Disruption of the jejunal migrating motor complex by gastric distension and feeding in the dog. 381

MARSHALL Janice M. Analysis of cardiovascular responses evoked following changes in peripheral chemoreceptor activity in the rat. 393

WEINREICH D. & WONDERLIN W.F. Inhibition of calcium-dependent spike after-hyperpolarization increases excitability of rabbit visceral sensory neurones. 415

WEINREICH D. & WONDERLIN W.F. Copper activates a unique inward current in molluscan neurones. 429

KLOCKGETHER Thomas Excitatory amino acid receptor-mediated transmission of somatosensory evoked potentials in the rat thalamus. 445

SAKURAI Masaki Synaptic modification of parallel fibre–Purkinje cell transmission in *in vitro* guinea-pig cerebellar slices. 463

ABE M., HOSHI T. & TAJIMA A. Characteristics of transmural potential changes associated with the proton–peptide co-transport in toad small intestine. 481

MAYER Mark L. & WESTBROOK Gary L. Permeation and block of *N*-methyl-D-aspartic acid receptor channels by divalent cations in mouse cultured central neurones. 501

COBBS W.H. & PUGH JR E.N. Kinetics and components of the flash photocurrent of isolated retinal rods of the larval salamander, *Ambystoma tigrinum*. 529

FUJIKADO Takashi & NODA Hiroharu Saccadic eye movements evoked by microstimulation of lobule VII of the cerebellar vermis of macaque monkeys. 573

PROCEEDINGS OF THE PHYSIOLOGICAL SOCIETY

17–18 *July* 1987

Oxford Meeting

DEMONSTRATIONS

Chowienczyk P.J., Cochrane G.M., Edwards A.D., Farmery A.D. & Wolff C.B. Lung volume and dead space in man from single-breath measurement of airway CO_2 and expired volume. 2*P*

Woods R.I. Staining of phospholipid granules in Type II alveolar cells in lungs from fetal and neonatal pigs and sheep. 3*P*

Hanson M.A., Moore P.J. & Nijhuis J.G. Chronic recording from the phrenic nerve in fetal sheep *in utero*. 4*P*

Bond G., Dakin T.A. & Shepherd A. Measurement of simple-reaction time and choice-reaction time using a BBC computer. 5*P*

Simons T.J.B. Optical probes for Zn^{2+} ions. 6*P*

Howson M.G., Khamnei S., McIntyre M.E., O'Connor D.F. & Robbins P.A. A rapid computer-controlled binary gas-mixing system for studies in respiratory control. 7*P*

Nunn B.J. Precise measurement of cyclic GMP-activated currents in membrane 'patches' from salamander rod outer segments. 8*P*

Butler P.J. & Woakes A.J. An ultrasonic phase-shift flowmeter for the measurement of respiratory airflow. 9*P*

Cole H.M., Harris T.R. & Wheal H.V. Three-dimensional reconstruction of rat cortical neurones using image-processing techniques. 10*P*

Brock J.A. & Cunnane T.C. Investigation of the mechanism of inhibition by prostaglandin E_1 of electrically evoked transmitter release from sympathetic nerves of the guinea-pig vas deferens *in vitro*. 11*P*

Douglas R.J. & Martin K.A.C. A multiprocessor system for presenting visual stimuli and logging extra- and intracellular neuronal responses. 12*P*

Brown H.F. & Denyer J.C. Isolation of rabbit sino-atrial node cells. 12*P*

COMMUNICATIONS

Kroese A.B.A. & Schellart N.A.M. Evidence for velocity- and acceleration-sensitive units in the trunk lateral line of the trout. 13*P*

Ikeda Hisako, Robbins J. & Wakakuwa K. Dopamine (D2) receptors mediate noradrenaline action on cat retinal ganglion cells. 14*P*

Cook Alison & Mobbs Peter Membrane currents of neurones in the ganglion cell layer of retinal slices isolated from the tiger salamander retina. 15*P*

Attwell David, Everett Karen & Sarantis Monique Glutamate depolarizes cones isolated from the tiger salamander retina. 16*P*

Nunn B.J. Ionic permeability ratios of the cyclic GMP-activated conductance in the outer segment membrane of salamander rods. 17*P*

Chamberlain S. & Lewis D.M. A comparison of reinnervation of fast and slow muscle in the rat. 18*P*

Al-Amood W.S. Response of fast twitch muscle in rat to low rate chronic stimulation. 19*P*

Revest P.A. Excitation of barnacle muscle by glutamate analogues and proctolin. 20*P*

Dangain J. & Vrbova G. Response of skeletal muscles from normal and dystrophic mice ($C57B1/6Jdy^{2J}$) to a local decrease in Ca^{2+}. 21*P*

de Tombe Peter P. & ter Keurs Henk E.D.J. The effect of temperature on the force-sarcomere-velocity relation in trabeculae from rat heart. 22*P*

Blinks J.R., Cai Y.-D. & Lee N.K.M. Inositol 1,4,5-trisphosphate causes calcium release in frog skeletal muscle only when transverse tubules have been interrupted. 23*P*

Ashley C.C., Barsotti R.J., Ferenczi M.A., Lea T.J. & Mulligan I.P. Fast activation of skinned muscle fibres from the frog by photolysis of caged-calcium. 24*P*

Bruton J.D. Hypertonic contractures of isolated rat soleus muscle. 25*P*

Fujii K. Electrophysiological evidence that adenosine triphosphate (ATP) is a co-transmitter with acetylcholine (ACh) in isolated guinea-pig, rabbit and pig urinary bladder. 26*P*

Barcenas-ruiz L., Beuckelmann D.J. & wier W.G. $[Ca^{2+}]_i$-transients, measured with fura2, and membrane currents that result from Na/Ca exchange in single isolated guinea-pig ventricular myocytes. 27*P*

Lipp Peter & Pott Lutz Transient inward current and an outward-rectifying background current in single guinea-pig cardiac cells are blocked by a vesicular sodium–calcium exchange inhibitor. 28*P*

Hadley R.W. & Hume J.R. Inhibitory effects of Bay K 8644 on Ca channels in isolated guinea-pig myocytes. 29*P*

Hagiwara N., Ho W.K. & Irisawa H. Hyperpolarization-activated current is regulated by an intracellular Ca in rabbit sino-atrial node cells. 30*P*

Hilgemann Donald W. A methodology for longitudinal spectrophotometric measurements in single myocytes: extracellular calcium transients. 31*P*

Egan T.M., Noble D., Noble S.J., Powell T. & Twist V.W. Evidence for a $[cAMP]_i$-dependent mechanism underlying the isoprenaline-induced depolarization of guinea-pig ventricular myocytes. 32*P*

Ashida T., Blaustein M.P., Goldman W.F., Schaeffer J. & Wade J.B. Use of ryanodine to determine the role of the sarcoplasmic reticulum on contractions of isolated rings of rat aorta and bovine tail artery. 33*P*

Lederer W.J., Nichols C.G. & Smith G.L. Mechanical and electrical responses of isolated rat cardiac myocytes to metabolic blockade. 34*P*

Khatib S.Y. Isovolumic contraction produces different electrical restitution curves from different areas of the intact isolated rabbit ventricle. 35*P*

Van Vliet B.N. & West N.H. Chronic (16-day) effects of pulmocutaneous arterial baroreceptor denervation on blood pressure and heart rate of conscious toads. 36*P*

O'Donnell C.P. Contraction of capacitance vessels during hypoxia in the isocapnic, anaesthetized cat. 37*P*

Bennett T. & Gardiner S.M. Cardiovascular effects of α-methyl-DL-*p*-tyrosine in Long Evans and Brattleboro rats. 38*P*

Kentish J.C. & Solaro R.J. Differential pH sensitivity of Ca^{2+}-activated force production in myofibrils from adult and neonatal rat hearts. 39*P*

Allen D.G., Elliott A.C. & Orchard C.H. The metabolic effects of acidosis in isolated ferret hearts. 40*P*

Boyett M.R., Kirby M.S., Orchard C.H. & Roberts A. The effect of acetylcholine (ACh) on isolated ferret ventricular muscle preparations. 41*P*

Mitsuiye T. & Noma A. Inactivation of the guinea-pig cardiac Na channel as examined by the new oil-gap method. 42*P*

Lang B., Newsom-Davis J., Peers C. & W.-Wray D. Selective action of Lambert-Eaton myasthenic syndrome antibodies on Ca^{2+} channels in the neuroblastoma × glioma hybrid cell line NG108 15. 43*P*

Clapp L.H., Singer J.J., Vivaudou M.B. & Walsh Jr J.V. A diacylglycerol analogue enhances voltage-activated Ca^{2+} current in freshly dissociated smooth muscle cells from the stomach of the toad. 44*P*

Adams D.J., Lategan T.W., Lodge N.J. & van Breemen C. Inward rectifying K^+ channels and thrombin-activated cation channels in cultured endothelial cells from bovine pulmonary artery. 45*P*

Capiod T. & Ogden D.C. The properties of single apamin-sensitive potassium ion channels in guinea-pig hepatocytes. 46*P*

Inoue M., Nakajima S. & Nakajima Y. Pertussis toxin abolishes somatostatin-induced enhancement of inward rectification in brain neurones. 47*P*

Meves H. & Rubly N. Effects of chemical modification of carboxyl groups on the gating current of the frog node of Ranvier. 48*P*

Baumann K.I., Hamann W. & Leung M.S. The effect of close arterial infusion of neomycin on slowly adapting cutaneous mechanoreceptors in the cat. 49*P*

Keeler R., Ledsome J.R., Rankin A.J. & Wilson N. Mechanism for the release of atrial natriuretic peptide with tachycardia in the anaesthetized rabbit. 50*P*

Marples D. & Taylor A. A further comparison of the hydrosmotic responses to vasopressin (VP) and *N*-ethyl maleimide (NEM) in the isolated toad urinary bladder. 51*P*

Brownlee A.A., Lee G. & Mills Ivor H. Potentiation of the natriuretic action of angiotensin by the Na/K ATPase inhibitor bufalin in the rat. 52*P*

Phillips M.E. & Taylor A. Characteristics of inhibition of the hydrosmotic effect of vasopressin by nocodazole in isolated perfused cortical collecting tubules of the rabbit. 53*P*

Garland H.O. & Lewis A.G. A comparison between right and left kidney function in rats with unilateral renal anterior pituitary implants. 64*P*

Benchetrit G., Guz A., Hamilton R., Pham Dinh T. & Shea S.A. Do human adult identical twins have similar breathing patterns at rest? 55*P*

Paterson D.H. & Whipp B.J. The kinetics of oxygen uptake during heavy exercise in man. 56*P*

Cunningham D.J.C. & Douglas C.G. Changes in human blood lactate concentration early in light steady exercise. 57*P*

Jacobi M.S., Patil C.P. & Saunders K.B. Comparison of transient, steady state and rebreathing methods of measuring the ventilatory response to carbon dioxide in man. 58*P*

Berkenbosch A., DeGoede J., Olievier C.N., Schuitmaker J.J. & Ward D.S. Dynamics of ventilation following sudden isocapnic changes in end-tidal O_2 in cats. 59*P*

Hale M.J. & Patrick J.M. Ventilatory patterns during human speech in progressive hypercapnia. 60*P*

Lung M.A. & Wang J.C.C. Autonomic nervous stimulation on canine nasal vascular and airway resistances. 61*P*

Kennedy Miriam Investigation of the mechanisms involved in the ventilatory responses to intraperitoneal administration of CO_2 in the anaesthetized cat. 62*P*

Bradford A., Manning M. & O'Regan R.G. Responses of carotid body blood flow and chemoreceptor activity to administration of vasopressin in the anaesthetized cat. 63*P*

Barer Gwenda & Bee Denise A dopamine antagonist and the ventilatory response to hypoxia in normal and chronically hypoxic rats. 64*P*

Band D.M. & Linton R.A.F. The interaction of hypoxia and K^+ on the carotid chemoreceptor in anaesthetized cats. 65*P*

Ashcroft Frances M. & O'Donnell Jean Tolbutamide, an inhibitor for ATP-sensitive K channels, excites carotid body chemoreceptors in the cat. 66*P*

Nye Piers C.G., Paterson David J. & Petersen Ebbe S. The effect of beta adrenergic blockade on the carotid body responses to hyperkalaemia in the cat. 67*P*

Tatar M., Webber S. & Widdicombe J.G. Respiratory reflexes and upper airway resistance in anaesthetized dogs. 68*P*

Hanson M.A., Kumar P. & Williams B.A. Developmental changes in the reflex respiratory response to alternations of F_{I,O_2} in the newborn kitten. 69*P*

Hardman A.E., Mayes R. & Williams C. Onset of blood lactate accumulation and endurance performance in endurance-trained and sprint-trained athletes. 70*P*

Imms F.J. & Mehta D. Hyperventilation during sustained isometric handgrip and quadriceps contractions in man. 71*P*

Harmon Mary & Nimmo Myra A. Quantitative histochemical analysis of skeletal muscle adaptation to endurance training in man. 72*P*

Gleeson M., Greenhaff P.L. & Maughan R.J. The effects of acid-base disturbances on the metabolic response to high-intensity exercise in man. 73*P*

de Boer R.W., de Groot G., de Koning J., Sargeant A.J. & van Ingen Schenau G.J. A peculiar pattern of muscle contraction during human locomotion: speedskating. 74*P*

Coats A., Conway J., Isea J.E., Pannarale G., Sleight P. & Somers V. Systemic and forearm vascular resistance after acute leg exercise in man. 75*P*

Birch R., Kooner J.S., Mathias C.J., Peart W.S. & Stone F. Clonidine induces differential changes in innervated and denervated limbs of humans with unilateral brachial plexus injury. 76*P*

Edwards R.J., Gooderson Patricia M.E., Scriven Julia G. & Streets D.F. Changes in human upper-body physical fitness during recovery from sustained military operations. 77*P*

Eccles R. & Tolley N.S. The effect of a nasal airflow stimulus upon human alae nasi e.m.g. activity. 78*P*

Barnes G.R. & Ruddock C.J.S. Characteristic features of the ocular pursuit response to an unpredictable target motion stimulus in man. 79P

Biguer B., Donaldson I.M.L., Hein A. & Jeannerod M. Further observations on the visual effects of vibrating the neck muscles in man. 80P

MacDonald I.A. & Mansell P. Effects of a 7-day period of underfeeding on the physiological responses to infused adrenaline in non-obese women. 81P

Carnan Elspeth & Gillespie J.I. Measurements of interstitial K^+ and Ca^{2+} ion concentrations in the early chick embryo. 82P

Effros R.M., Mason G.R., Silverman P. & Hukkanen J. Transepithelial transport of labelled sodium against a concentration gradient in fluid-filled rat lungs. 83P

Levin R.J. & Young A. The influences of tyramine released endogenous noradrenergic stores upon electrogenic secretion in the starved isolated rat jejunum. 84P

Lambert Ian H. Activation of the volume- or ionophore A23187 plus Ca^{2+}-induced Cl^- transport pathway in Ehrlich mouse ascites tumour cells is mediated via leukotriene-D_4. 85P

Brading Alison F. The effect of Na ions and loop diuretics on transmembrane ^{36}Cl fluxes in isolated guinea-pig smooth muscles. 86P

Aickin C. Claire Na, K, Cl co-transport is involved in Cl accumulation in the smooth muscle of isolated guinea-pig vas deferens. 87P

Brown A.M. & Jones Barbara E. Evidence that stimulation of glycolysis by calcium in human red cells requires calcium-pump turnover. 88P

Wheeler C.P.D. & Yudilevich D.L. Inhibition of adenosine metabolism by 2′-deoxycoformycin and characterization of an adenosine carrier in the perfused guinea-pig placenta. 89P

Daut J., Mehrke G., Nees S. & Newman W.H. The electrogenic sodium pump in guinea-pig coronary endothelial cells. 90P

Abbott N. Joan & Zlokovic B.V. A preparation for the study of glial transport: the glial blood–brain barrier of the dogfish *Scyliorhinus canicula*. 91P

Harvey B.J. & Thomas R.C. Intracellular pH and calcium effects on sodium conductance and transport in isolated frog skin epithelium. 92P

Argent B.E., Gillespie J.I. & Greenwell J.R. Optical measurement of intracellular pH (pH_i) in single isolated rat pancreatic acini: evidence of Cl^-/HCO_3^- exchange. 93P

Ibu J.O. & Short A.H. Effects of phlorizin and phloretin on transport of glucose, galactose and fructose in perfused isolated liver of rat. 94P

Jones Christopher J. & Quinton Paul M. Intracellular electrical measurements on perifused ducts isolated from eccrine sweat glands on normal subjects and patients with cystic fibrosis. 95P

Adam-Vizi V. & Knight D.E. Does botulinum toxin type D inhibit exocytosis by ADP-ribosylation? 96P

Henderson Z. Dendrites of immunocytochemically identified cholinergic neurones in ferret brain display intense staining for acetylcholinesterase along the plasma membrane: an indication of the dendritic release of acetylcholine? 97P

Fern R., Harrison P.J. & Riddell J.S. The dorsal column projection of hindlimb group II muscle afferent fibres in the cat. 98P

Levings J.J. & Taylor E.W. Vagal preganglionic efferent innervation of the gut in the lesser spotted dogfish, *Scyliorhinus canicula* L.: a neuroanatomical study. 99P

Bradley D.J., Jordan D., Pascoe J.P., Paton J.F.R. & Spyer K.M. Cardiovascular responses to stimulation of the anterior insular cortex in rabbits occur only in association with muscle activity. 100P

Fellows S.J., Noth J., Prisett M. & Thilmann A.F. Stretch reflex latency at the relaxed normal human ankle is dependent on tendon compliance. 101P

Matthews P.B.C. Effect of arm cooling on long-latency reflex responses from the human first dorsal interosseus muscle – evidence for a group I contribution. 102P

Rees H., Roberts M.H.T. & Sherwood C.A. Antinociceptive effects of microinjection of D,L-homocysteic acid into the anterior pretectal nucleus of the rat. 103P

Angel A. & Halsey M.J. The effect of increased ambient pressure on motoneurone excitability in the rat. 104P

Lovick T.A. Paraventriculo-spinal neurones in the rat. 105P

Fruns M., Krieger C. & Sears T.A. Identification and electrical properties of rat spinal motoneurones in culture. 106P

Elliott J.R. & McElwee A.A. Inhibition of the membrane action potential of isolated rat dorsal root ganglion cells by n-hexanol: the effect of hyperpolarizing pre-pulses. 107*P*

Cervero F. & Lumb B.M. Most viscero-somatic neurones in the thoracic spinal cord of the cat have bilateral visceral inputs. 108*P*

Jancsó G. & Lawson Sally N. Perineural capsaicin treatment of the sciatic nerve in adult rats causes transganglionic changes in the spinal cord dorsal horn. 109*P*

Douglas R.J., Martin K.A.C. & Whitteridge D. Estimation of the amplitudes of theoretical unitary excitatory post-synaptic potentials in neurones of the cat striate cortex by a combination of biophysical and anatomical measurement. 110*P*

Jones H.E. & Sillito A.M. Directional asymmetries in the length tuning of single cells in the feline dorsal lateral geniculate nucleus (dLGN). 111*P*

Barnett Tertia F., Kilpatrick I.C. & Mozley Lyn S. Release of endogenous excitatory amino acids from slices of rat neocortex and their modulation by ventromedial thalamic lesions and 2-chloroadenosine. 112*P*

Palmer A.R. & Rees A. The effects of broadband noise on the rate-intensity functions of neurones in the guinea-pig inferior colliculus. 113*P*

Eaton S.A. & Salt T.E. *N*-Methyl-D-aspartate antagonists reduce the responses of rat thalamic neurones to noxious stimulation. 114*P*

Stelzer Armin & Wong Robert K.S. GABA receptors of isolated guinea-pig hippocampal neurones: intra- and extracellular regulatory factors. 115*P*

Collingridge G.L., Herron C.E. & Lester R.A.J. Properties of a frequency-dependent NMDA receptor-mediated synaptic potential in rat hippocampus *in vitro*. 116*P*

Aram J.A., Bindman Lynn J., Lodge D. & Murphy K.P.S.J. Glutamate-receptor-mediated e.p.s.p.s in layer V neurones in rat neocortical slices. 117*P*

Day B.L., Maertens de Noordhout A., Marsden C.D., Nakashima K., Rothwell J.C. & Thompson P.D. A comparison of the effects of cathodal, and anodal stimulation of the human motor cortex through the intact scalp. 118*P*

Amassian V.E., Quirk G.J. & Stewart M. Magnetic coil versus electrical stimulation of monkey motor cortex. 119*P*

Heavens R.P., McBride C.S. & Sirinathsinghji D.J.S. *In vivo* release of dopamine during perfusion of *N*-methyl-4-phenylpyridine (MPP^+) in the striatum of the rat: mediation via the dopamine uptake system. 120*P*

Ibbotson Vanessa, Ruddock K.H. & Terry Alison Parallel mechanisms for visual pattern discrimination in man. 121*P*

Dyball R.E.J. & Leng G. Action potential recordings from the rat neural lobe *in vivo*. 122*P*

Bicknell R.J., Chapman C. & Zhao B.-G. Functional kappa-opioid receptors on oxytocin and vasopressin secretory terminals isolated from rat neurohypophysis. 123*P*

Nicholson S.A. The effect of caffeine on plasma corticosterone and pituitary adrenocorticotrophin (ACTH) release on the rat is antagonized by adenosine. 124*P*

Burch Jane, Forsling Mary L. & Peysner K. The effect of testosterone on vasopressin secretion and fluid balance in the orchidectomized rat. 125*P*

Barbosa E., Giraldez F., Miner Cristina & Represa J.J. Bombesin reacts rates growth in quiescent chick embryo otocysts in culture. 126*P*

Kendrick A.H. & Laszlo G. Does the single-breath carbon monoxide transfer factor estimated during submaximal exercise in man exhibit a circadian rhythm? 127*P*

Hughes J.M.B. & Swenson E.R. Acetazolamide increases steady-state hypercapnic ventilatory response in hypoxia in humans. 128*P*

Carstairs Jill R. Autoradiographic mapping of calcitonin gene-related peptide (CGRP) binding sites in rat lung. 129*P*

Aoki S., Boubekeur K., Burrows L., Morley J. & Sanjar S. Recruitment of eosinophils by platelet activating factor (PAF) in the guinea-pig lung. 130*P*

Butler P.J. & Turner D.L. Maximum oxygen uptake and capillarity and enzyme activity in the gastrocnemius muscle of trained and untrained tufted ducks, *Aythya fuligula*. 131*P*

Dean H.G., Duggan J.P., Hervey G.R., Hussain S.H., Tobin G. & Whitaker E.M. The role of catecholamines in the metabolic response to cold in the rat. 132*P*

Abul H.T., Davidson Jillian, Milton A.S. & Rotondo D. The effects of the calcium-channel-blocking agent verapamil on the pyrogenic response to the interferon inducer polyinosinic polycytidylic acid and the hyperthermic response to intraventricular prostaglandin E_2 in the rabbit. 133*P*

Michell A.R. & Moss P. The gut and sodium regulation in sheep and other herbivores. 134*P*

POSTER COMMUNICATIONS

Bennett T., Gardiner S.M. & Macdonald I.A. Cardiac, renal and interscapular brown adipose tissue (IBAT) noradrenaline (NA) turnover in Long Evans and Brattleboro rats. 135*P*

Eisner D.A., Lederer W.J., Nichols C.G., O'Neill S.C., Smith G.L. & Valdeolmillos M. The effects of cyanide on membrane potential, contraction and intracellular pH in isolated rat myocytes. 136*P*

Eisner D.A., O'Neill S.C. & Valdeolmillos M. Any parameter which is affected by intracellular pH can be used to measure the absolute level of pH_i. 137*P*

Ellory J.C., Powell T., Ryder Kathryn O., Smith T.W. & Twist V.W. Ouabain-sensitive K^+ uptake in isolated rat and guinea-pig ventricular myocytes *in vitro*. 138*P*

Bateman A.C., Cast J.E. & Lab M.J. Electromechanical alternans in isolated Langendorf perfused rabbit heart. 139*P*

MacDermott Mary The intracellular concentration of free magnesium in rat skeletal muscles. 140*P*

Cooper R.G., Edwards R.H.T., Gibson H. & Stokes M. Human muscle fatigue: post-tetanic potentiation of low-frequency tetani is not related to altered excitation or slowing of relaxation. 141*P*

Cooper R.G., Edwards R.H.T. & Stokes M. Human muscle fatigue: excitation–contraction coupling failure in McArdle's disease. 142*P*

Chatamra K.-R. Daniel P.M. The loss of glycogen from denervated muscle. 143*P*

Baird M.C. & Williams A.J. Some factors which influence the gating behaviour of the reconstituted rabbit cardiac sarcoplasmic reticulum (SR) K^+ channel. 144*P*

Guth K., Potter J.D. & Winnikes K. Calcium-dependent force and skeletal troponin C_{DANZ} fluorescence in rabbit psoas skinned fibres. 145*P*

Argent B.E., Gray M.A. & Greenwell J.R. Characteristics of a large-conductance anion channel in membrane patches excised from rat pancreatic duct cells *in vitro*. 146*P*

Knight D.E. & Maconochie D.J. Muscarine induces an inward current in chicken chromaffin cells. 147*P*

Burges J., Newsom-Davis J., Vincent A. & W.-Wray D. Plasma factors from a myasthenia gravis patient without acetylcholine receptor antibody: effect on mouse neuromuscular transmission. 148*P*

Dark C.H., Greenidge E., Hayter A.P., McAteer E.J., Suer A.H., Tugwell A.C. & Wali F.A. Diaphragmatic fatigue produced by low- and high-frequency stimulation of the rat isolated phrenic nerve–diaphragm preparation. 149*P*

Fulton Barbara P. Development of inward rectification in A cells of isolated rat dorsal root ganglia. 150*P*

Collingridge G.L., Herron C.E. & Lester R.A.J. NMDA receptor involvement in synaptic potentials evoked by low-frequency stimulation in rat hippocampus *in vitro*. 151*P*

Mokha S.S. Effects of morphine on the responses of neurones in the superficial and deeper laminae of the trigeminal nucleus caudalis in the rat. 152*P*

Adams D.J., Fieber L.A. & Konishi S. Neurotransmitter action and modulation of a calcium conductance in rat cultured parasympathetic cardiac neurones. 153*P*

Heavens R.P. & Sirinathsinghji D.J.S. Mechanism of action of *N*-methyl-4-phenylpyridine (MPP^+) on the *in vivo* release of dopamine in the striatum of the rat: dependence on sodium but not calcium ions. 154*P*

Scholfield C.N. & Smith A. The enhancement of synaptic transmission by phorbol ester in the guinea-pig olfactory cortex. 155*P*

Bagust J., Kerkut G.A., Rakkah N.I.A. & Tyler A.W. Correlations in the patterns of spontaneous firing from lumbar dorsal roots on opposite sides of the cord recorded from isolated spinal cords of mice and hamsters. 156*P*

Phelps S. & Wheal H.V. Functional feed-forward synaptic inhibition of CA1 pyramidal cells in the rat hippocampus *in vitro*. 157*P*

Radpour S. & Wheal H.V. Comparison of synaptic inhibition in the CA1 region of slices from the septal and temporal poles of the rat hippocampus. 158*P*

Beresford I.J.M., Hall M.D., Hill R.G., Hughes J. & Richards S.J. The localization of cholecystokinin (CCK) binding sites on fetal striatal neurones grafted in the ibotenic acid-lesioned rat striatum. 159*P*

Day B.L., Marsden C.D., Nakashima K. & Rothwell J.C. Cutaneous effects on presynaptic inhibition of flexor Ia afferents in the human forearm. 160*P*

Thomas A.A.G., Wegener G. & Yonge R.P. A method for studying locust flight using magnetic resonance spectroscopy (MRS). 161*P*

Taylor E.W. & Whiteley N.M. Respiratory responses of the lobster (*Homarus gammarus*) to prolonged periods of aerial exposure during commercial shipment. 162*P*

Debnam E.S., Epstein O. & Srai S.K.S. Iron absorption across the microvillus membrane (MVM) of the isolated guinea-pig duodenum during development. 163*P*

Debnam E.S., Epstein O. & Srai S.K.S. Developmental changes in the autoradiographic localization of iron uptake by the isolated guinea-pig duodenum. 164*P*

Abbott N. Joan Vascular volume and vessel recruitment in *Sepia* tissues. 165*P*

Brookes F.B.C., Hamley E.J., Roberts K.W. & Winter E.M. Optimized and non-optimized peak power output in 11- to 13-year-old boys. 166*P*

Hla-Yee-Yee & Shirley D.G. The influence of posture on lithium clearance in man. 167*P*

Barker G., Boyd R.D.H., Lear G.H. & Sibley C.P. Incomplete perfusion of the *in vitro* isolated human placental lobule. 168*P*

Hanson M.A., Moore P.J., Nijhuis J.G. & Parkes M.J. Stimulation of fetal breathing movements during hypoxia by L-5-hydroxytryptophan in sheep. 169*P*

Figueroa J.P., Kreitzer L., Nathanielsz P.W., Pimentel G. & Schlafer D. Experimentally produced placental compromise: microsphere embolization of fetal placental vessels in the lamb resulting in fetal hypoxaemia. 170*P*

Terrar D.A. & Victory J.G.G. Effects of isoflurane on action potentials, membrane currents and contractions in cells isolated from guinea-pig ventricular muscle. 171*P*

Band D.M., Linton R.A.F. & Sneyd J.R. Ventilatory effects of potassium in hyperoxia, normoxia and hypoxia in anaesthetized cats. 172*P*